NOTES

FIFTY-SEVEN candidates for the Fellowship of the Royal Society have offered themselves during the present session. From these the Council have selected the following fifteen to be recommended to the Society for election at the annual meeting on June 7 next:—Prof. James Dewar, M.A.; Sir Joseph Fayrer, M.D., K.C.S.I.; Rev. Norman Macleod Ferrers, M.A.; Thomas Richard Fraser, M.D.; Brian Haughton Hodgson, F.L.S.; John W. Judd, F.G.S.; William Carmichael M'Intosh, M.D.; Robert M'Lachlan, F.L.S.; Prof. John William Mallet, Ph.D.; Henry B. Medlicott, M.A.; Henry Nottidge Moseley, M.A.; Prof. Osborne Reynolds, M.A.; William Roberts, M.D.; Prof. James Thomson, LL.D.; Prof. William Turner, M.B.

THE scientific men selected this year by the Universities of Edinburgh and Glasgow for the degree of LL.D. are well deserving of the honour. Among those on whom Edinburgh has conferred it are Mr. George Gore, F.R.S., Mr. J. B. Lawes, the well-known scientific agriculturist, Dr. Reinhold Röst, principal librarian to the India Office, and Mr. John Westlake, Q.C. Glasgow has given her degree to Prof. Andrews, F.R.S., president, and Prof. Allan Thomson, president-elect of the British Association.

THE Council of the Royal Microscopical Society have resolved to institute a lecture in memory of the late Prof. John Quekett, to be delivered from time to time by eminent microscopists, to whom will be presented the Quekett Medal provided out of the Medal Fund collected some years since. The first of these lectures will be delivered in the theatre of King's College on May 2, at 8 P.M., by Sir John Lubbock, Bart., M.P., F.R.S., the subject being "On Some Points in the Anatomy of Ants."

MR. WARD HUNT stated in the House of Commons last week that the deductions of the Astronomer-Royal with respect to the late transit of Venus will be ready in about six weeks, but that some months must elapse before the photographic records will be completed, without which the report would be imperfect.

THE Paris Academy of Sciences held its anniversary on the 23rd inst., Vice-Admiral Paris being in the chair. Only one national prize was awarded this year to M. Darboux for a memoir on "Singular Integrals," obtained in the solution of the differential equations of the first order. This work, of exceptional excellence, will be published in "Recueil des Savants Étrangers" at the expense of the Academy. A number of minor prizes were awarded for memoirs in botany, chemistry, medicine, &c. But the largest number of rewards were distributed amongst authors of works already published and not specially written for competition; this is a laudable innovation. The following are some of the awards:—The prize for the progress of the application of steam to the military navy to M. Ledieu, as author of an elementary treatise on "Marine Engines." The Poncelet Prize to M. Kretz, an engineer in the French Civil Service, for his publication of Poncelet's works on "Mechanics." The Delmont Prize to M. Ribaucourt, engineer of Ponts et Chaussées, for his geometrical disquisitions on the tri-orthogonal system. M. Violle was rewarded by a donation of 80*l*. for his researches on the heat generated by the sun; MM. Vicaire by a donation of 40*l*. each for similar researches. The Monthyon Medal to M. Melsens for his method of working mercury ores, as practised at Ydria, where working men have been effectually protected against toxical emanations. M. André took one prize for his experiments on the causes of the "black drop" seen by some observers of the transit of Venus last century. M. Gaugain obtained a similar reward for his long continued observations on tourmaline and other electrical disquisitions. The Cuvier prize was awarded to M. Fouqué, the celebrated Santorin and Etna explorer. MM. Filhol and Velaine obtained one prize each for the excellent zoological preparations collected at St. Paul and at Campbell Islands on the occasion of the last transit of Venus. M. Palisa, director of the Pola Observatory, obtained the Lalande Medal for the discovery of nine small planets and the rediscovery of Maïa, lost from 1861 to 1876. The usual number of prizes have been proposed for 1877 and following years. A programme stating the conditions will be sent to any person writing to the secretary of the Academy of Sciences. No limitation of nationality is imposed, and the necessity of writing in French or Latin is practically abolished, at least for several of the prizes. A sum of about 4,000*l*. is to be distributed amongst thirty-eight different competitors, exclusive of the Breant prize. M. Dumas read the *éloge* of MM. Brogniard, two naturalists who were influential members of the Academy of Sciences, and whose lives were long associated in kindred work. The eminent perpetual secretary obtained one of the greatest successes of his whole academical career. The address was a masterpiece, most carefully written and admirably delivered.

A LECTURE delivered in Washington in the beginning of April, at the opening of the summer course of the National Medical College, by Dr. Elliott Coues, the well-known ornithologist, has attracted some attention in America not only by contrast with similar addresses, but for its mode of treatment and advanced views in discussing the bearings of anatomical science on the question of the origin of species and man's place in nature.

A VERY extensive Etruscan necropolis has been discovered at Montelparo, near Ascoli-Piceno (Umbria). An enormous quantity of bronze, iron, and terra-cotta objects have been and are being found in the grounds, chiefly consisting of helmets, armillas, collars, buckles, nails, spurs, bows, rings, lances, spears, swords, and thousands of perforated bronze grains or beads, besides numerous objects of amber, glass, shells, and pottery, all of which are likely to be secured by the Italian Government for the Florentine Museums.

THE Bradford Scientific Association *conversazione*, we are glad to hear, has been a great success, over 1,600 persons having visited it. It was held for two days—Wednesday and Thursday, April 11 and 12—and the members were so encouraged by the support received, that they continued the exhibition until the Saturday. Over 100 microscopes were shown nightly, and the collective display of physical and chemical apparatus has, we believe, not been equalled in the north. The society introduced a novel feature in the management of the affair—admitting those engaged in teaching at a reduced charge, while demonstrations on various subjects took place each evening, according to a printed time table, given to each person on entrance. They endeavoured to take as their model the Loan Collection at South Kensington. This enterprising society have demonstrated the immense educational value which a collection of scientific instruments must have, if accompanied by proper explanation. They are so satisfied with the success, that they will attempt things on a much larger scale in the future.

IT was announced at the last meeting of the Paris Geographical Society that the expedition organised to investigate the possibility of cutting a channel through the Isthmus of Darien has proved a failure.

TWO Prussian officers have arrived in Paris for the purpose of determining telegraphically the longitude of Berlin. Two French officers have been despatched to Berlin in order to carry out similar operations. The apparatus to be used in Paris have been located at Montsouris, under the superintendence of M. Mouchez and the Bureau des Longitudes. The ultimate aim of the operation is to connect the French trigonometrical triangulation with the system of the Geodesical International Association, which is covering almost the whole of Europe.

We recently announced that Mr. Siddal, of the Chester Society of Natural Science, had detected Radiolarians in Carboniferous limestone. At a meeting of the Society lately it was announced that another member of the Society (Mr. Shrubsole, F.G.S.) had disovered both Foraminifera and Radiolarians in the chalk of the North Wales border.

Mr. George Cross, of Chester, a member of the Chester Natural Science Society, and conductor and teacher of the classes formed in that city under the auspices of the Government Science and Art Department, died on the 16th inst. at the early age of forty. As an able scientific man of genial disposition and kindly feeling his loss is deplored by a large circle of friends.

The Agricultural Society of France is building a large hotel in the Rue de Bellechasse at Paris, which will be fitted with every convenience for meetings and lectures, including museum and libraries. The expenses are defrayed by a benefactor who has taken effectual measures to conceal his name. The cost will be more than 20,000*l.*

The Society of Arts are prepared to offer prizes of 5*l.*, 3*l.*, and 2*l.* respectively, and certificates, for proficiency in qualitative blowpipe analysis. The competition is open to any person, but as it is intended principally for those interested in the mining industries of Devon and Cornwall, the examination will be held in the centre of the mining districts. The arrangements will be in the hands of the committee of the Miners' Association, and intending candidates should apply to the honorary secretary of the Association, Mr. J. H. Collins, Lemon Street, Truro. The examination will be held at Redruth, from 5 to 9 P.M., on Tuesday, June 5, 1877.

The subject of the Rhind Lectures on Archæology in connection with the Society of Antiquaries of Scotland this year is :—"Do we possess the means of determining scientifically the condition of primeval man and his age on the earth?" The lectures, six in number, commenced yesterday, the lecturer being Dr. Arthur Mitchell.

At four o'clock on Monday morning a sharp shock of an earthquake was felt at Oban. The motion was undulatory, accompanied by a rumbling noise, and terminating in a sort of jerk. The motion did not last above six seconds. Furniture and articles of household use were jerked upwards, and pieces of crockery were thrown from the shelves. A lighter shock was felt in the Island of Kerrera last week, and a short time ago a shock was felt in Tobermory, Island of Mull.

At the first meeting for the year of the West Riding Geological and Polytechnic Society held at Ripon on April 4, the Marquis of Ripon gave an address on scientific pursuits and their results. He advocated thoroughness in all such work, and urged his hearers not to accept facts without complete investigation, nor yet stubbornly to reject facts because they did not accord with their own preconceived ideas.

Under the title of "Giuseppe de Notaris, sua Vita e sue Opere," an interesting sketch of the life of this eminent botanist, who died in January last, is published, reprinted from the columns of the Roman journal, the *Opinione*. De Notaris was a member of a noble but poor Italian family, and was born at Milan in 1805. Brought up to the medical profession, he early devoted himself to the study of botany, and filled botanical chairs successively at Milan, Turin, Genoa, and Rome. His labours were directed mainly to the description and the principles of the classification of cryptogams, especially of mosses, in which his services to science are very great and his publications very numerous. Until the last few years his labours received but little recognition by the State, and the publication of their results was frequently interrupted by his poverty; but the Municipality of Genoa did itself immortal honour by publishing at its expense his important "Epilogo della Briologia italiana." In 1872 de Notaris was elected a foreign member of the Linnean Society of London.

The Mathematical and Physical Sections of the Russian Geographical Society discussed at a recent meeting a scheme for the thorough exploration of the Lower Angara outflow of Lake Baikal, the pecuniary means for the purpose being offered by M. Sibiryakof. The navigability of this important water-communication would be the principal problem to be solved by the explorers. At the same meeting M. Vojeikoff described the results of his meteorological travels to British India.

Some striking experiments have been lately made by M. Daubrée, on the physical and mechanical action of strongly-compressed incandescent gas arising from combustion of powder. In one case a thin steel plate (23 sq. ctm. surface), rolled up, was inclosed in the chamber along with 12 grm. of powder, which was fired by electricity. The steel was completely fused, and transformed into an ingot curiously twisted and swollen, resembling the ferruginous skeleton of some meteoric irons. A good deal of the iron had passed into the state of sulphuret, found as a fine powder. These remarkable changes must have occurred in a fraction of a second. In another series of experiments the gases formed had opportunity of escape by a small orifice in the side of a hollow cylindrical cock (with conical top) adapted and screwed into the chamber. Here the hot particles of gas fused and carried off the steel in the state of fine powder, which was sulphurised immediately. The cock was put considerably out of shape, deep sinuous furrows being made in its surface, and in one case reaching the central cavity so as to make a second orifice, while the terminal cone wholly disappeared. An abundant metallic dust, incandescent, was projected into the atmosphere. Analogous phenomena probably occur in volcanoes, meteorites, &c.

Our readers will remember the announcement made by us some time ago of the shipment of a consignment of white-fish eggs, furnished by the United States Fish Commission, to Wellington, New Zealand. We are happy to state that, as the result of this action, a report has been received of the safe arrival of these eggs at Wellington in good condition. The young fish at the end of five days from the time of hatching, were three-quarters of an inch long, very transparent, with bright yellow eyes, and very lively, apparently doing well.

According to a recent Austrian census it appears that the percentage of cretinism ranges from a small figure up to as high as forty in the different districts of the Alpine parts of the empire. The proportion to every ten thousand inhabitants is, in the Salzburg district, 40; in Upper Austria, 18·3; in Styria, 17; in Silesia, 10; in Tyrol, 7·6, &c.

The last number of the *Isvestia* of the Russian Geographical Society contains some extracts from the journal kept by Dr. Miklucho Maclay during his cruise in Western Micronesia, from March to June, 1876. In the early part of March, after visiting the Island of Geby, lying under the equator, Dr. Maclay, about the end of March, passed by Auropic Island, the inhabitants of which he describes as not very dark, with thick curly hair. Thence he proceeded to Mogemos, or Mackenzie Island, Woap Island, and others, on his way to the Pelew Archipelago, where he stayed about two weeks, studying very interesting specimens of the "picture-writing" and folk-lore. The shameful exportation of the inhabitants by whites, which he had opportunity of witnessing during his cruise, will be the subject of a special report. From the Pelew Islands the indefatigable traveller proceeded to the southern and then to the northern shore of Admiralty Island, noticing the remarkable prognathous development of the Melanesian natives of this island, as well as those of the island Agomes, of the Hermite Archipelago. After a short visit to the Ninigo Islands, Dr. Maclay returned to the shore bearing his name, the natives of which received him very kindly. He built a house for himself, where he intended to remain, pursuing his anthropological researches.

THE *Journal of Forestry and Estates Management* is the title of a new shilling monthly, which will appear on May, 1 published by Messrs. J. and W. Rider, of Bartholomew Close, E.C. It will be devoted to the interests of Arboriculture in its scientific, practical, and economic aspects, and will give a large portion of its space to matters appertaining to the general management of estates.

WE have received through Mr. Tucker, from Mr. J. M. Wilson, Rugby, two guineas towards the Gauss Memorial Fund.

THE inventor of the new electric seismograph referred to last week is not Father Secchi, but Father Cecchi, of the Scuole pié at Florence.

THE additions to the Zoological Society's Gardens during the past week include a Rusa Deer (*Cervus rusa*) from Java, presented by Mr. A. A. Frazer, F.Z.S.; a Bay Bamboo Rat (*Rhizomys badius*) from India, presented by Mr. J. Wood Mason; a Horned Lizard (*Phrynosoma cornutum*) from Texas, presented by Mr. T. Clover; a Brown Monkey (*Macacus brunneus*) from Assam, deposited; a Demeraran Cock of the Rock (*Rupicola crocea*) from Demerara, purchased; two Chinchillas (*Chinchilla lanigera*), born in the Gardens.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, March 15.—"On the Tides of the Arctic Seas.—Part VII. Tides of Port Kennedy, in Bellot Strait." (Final Discussion.) By the Rev. Samuel Haughton, M.D. Dublin, D.C.L. Oxon., F.R.S., Fellow of Trinity College, Dublin.

The tidal observations at Port Kennedy were made hourly for twenty-three days; and in my former discussion of these tides (Part VI.) I used only the observations made in the neighbourhood of H. W. and L. W., obtaining the following results for the tidal coefficients:—

Diurnal Tide.	*Semidiurnal Tide.*
$S = 23{\cdot}4$ inches.	$S = 7{\cdot}0$ inches.
$i_s = 5^h\ 12^m$.	$i_s =$,,
$M = 20{\cdot}9$ inches.	$M = 17{\cdot}0$ inches.
$i_m = 0^h\ 33^m{\cdot}8$.	$i_m = -\ 0^h\ 12^m$.

In the present discussion I have employed all the hourly observations made during the twenty-three days, and have obtained the following results:—

Diurnal Tide.	*Semidiurnal Tide.*
$S = 36{\cdot}4$ inches.	$S = 5{\cdot}9$ inches.
$i_s = 3^h\ 2^m$.	$i_s = 2^h\ 48^m$.
$M = 18{\cdot}5$ inches.	$M = 15{\cdot}5$ inches.
$i_m = -\ 2^h\ 48^m$.	$i_m = 6^h\ 2\tfrac{1}{2}^m$.

The present more complete discussion fully confirms the result before obtained by me, respecting the great magnitude of the solar diurnal tide at this station, and also shows a satisfactory agreement in the other coefficients obtained from H. W. and L. W. observations only.

The method employed in the present paper is based on Fourier's Theorem, by which the height of tide is expressed as follows:—

$$F = A_0 \begin{array}{l} + A_1 \cos s + A_2 \cos 2s + \&c., \\ + B_1 \sin s + B_2 \cos 2s + \&c., \end{array}$$

where

F = height of water.
s = hour-angle of sun.

The coefficients A_0, A_1, A_2, B_1, B_2, &c., being found by well-known formulæ, they are again expressed, by Fourier's Theorem, as follows:—

$$A_n = a_0 \begin{array}{l} + a_1 \cos u + a_2 \cos 2u + \&c. \\ + b_1 \sin u + b_2 \sin 2u, \end{array}$$

where u passes through all its changes in a fortnight, and the coefficients are calculated in a similar manner.

The known theoretical formulæ for the diurnal and semidiurnal tides, expressed in terms of parallax, declination, lunar and solar, hour-angles, are now converted into functions of the true and mean anomaly, and of the sun's hour-angle, and finally into simple functions of s and u. These expansions are now compared, term by term, with the terms of the tidal expansions found by means of Fourier's Theorem, and the final lunar and solar tidal coefficients calculated out with ease.

Although the short period of observation at Port Kennedy (23 days) renders this method of discussion not much more valuable than the usual method of H. W. and L. W. observations, I have developed it at length in the hope of applying the method to more complete series of Arctic tides, which I hope shortly to lay before the Royal Society.

March 22.—"On Friction between Surfaces moving at Low Speeds," by Fleeming Jenkin, F.R.SS. L. and E., Professor of Engineering in the University of Edinburgh, and J. A. Ewing.

The common belief regarding friction, which is based on the researches of Coulomb and Morin, is that between surfaces in motion the friction is independent of the velocity, but that the force required to start the sliding is (in some cases at least) greater than the force required to overcome friction during motion; in other words, the static coefficient is usually considered to be greater than the kinetic. It occurred to the authors that there might possibly be continuity between the two kinds of friction, instead of an abrupt change at the instant in which motion begins. We should thus expect that when the relative motion of the surfaces is very slow there will be a gradual increase of friction as the velocity diminishes. Whether any such increase takes place at very low speed is left an open question by the experiments of Coulomb and Morin, whose methods did not enable definite measurements of the friction to be made when the velocity was exceedingly small. The authors have succeeded in measuring the friction between surfaces moving with as low a velocity as one five-thousandth of a foot per second, and have found that in certain cases there is decided increase in the coefficient of friction as the velocity diminishes.

The surfaces examined were steel on steel, steel on brass, steel on agate, steel on beech, and steel on greenheart—in each case under the three conditions, dry, oiled, and wet with water. In the cases steel on beech oiled or wet with water, and steel on greenheart oiled or wet with water, the coefficient of friction increased as the velocity diminished between the two limits given above, the increase amounting to about twenty per cent. of the lower value. It appeared that at the higher limit of velocity there was little further tendency to change in the coefficient, but it is impossible to say how much additional change might take place between the lower limit of the velocity and the higher. In the case of steel on agate wet with water there was a similar but much less marked increase of friction as the velocity decreased. And in the case of steel on steel oiled there was a slight and somewhat uncertain change of the opposite character, that is, a decrease of the friction as the velocity decreased. This case, however, would require further examination. In all other cases the friction seemed to be perfectly constant and independent of the velocity. Out of all the sets of circumstances investigated, the only ones in which there was a large difference between the static and kinetic values of the coefficient of friction were those in which a decided increase was observed in the kinetic value on the speed decreased. This result renders it exceedingly probable that there is continuity between the two kinds of friction.

Linnean Society, April 5.—Prof. Allmann, F.R.S., president, in the chair.—Capt. Chimmo, R.N., the Rev. J. Constable, and Prof. Liversidge, of Sydney, N.S.W., were elected Fellows of the Society.—In acknowledging a donation from the author (Mr. H. J. Elwes), of the first part folio, "Monograph of the Genus Lilium," the President congratulated the Society on